

CENTER FOR SOLID OXIDE FUEL CELL TECHNOLOGY

CENTER

The center was established in 1996, to develop solid oxide fuel cell (SOFC) technology for the direct conversion of chemical energy of a variety of fuels, such as natural gas, coal gas and other reformed logistic fuels, into electricity at a very high efficiency. Initially, the Center is developing cell stack technology for a 2-5 kilowatt unit, which has many potential applications with emphasis on distributed power for residential and remote locations for on-demand electrical power that is clean, efficient, reliable, and noise-free. Small portable power units in the 10-100 Watt ranges are feasible.

TECHNOLOGY

The center technologies are based on the design and fabrication of novel, anode-supported solid oxide fuel cells with highly efficient electrodes that have a very low resistance. This concept makes it possible to develop a cost-effective, compact power unit for direct conversion of chemical energy of fuels into electricity for remote and residential applications.

ACCOMPLISHMENTS

The Center has successfully developed a low cost manufacturing method for the fabrication of 10x10 cm cells. Stacks containing up to 40 cells (5x5cm) delivering up to 250 Watts of power for up to 300 hours have been successfully fabricated. In addition, these fuel cells operate at lower temperatures (650 – 800°C), but higher efficiency. The center has been successful in attracting research and development grants from federal agencies as well as the Electric Power Research Institute (EPRI) and the Gas Research Institute (GRI). A consortium formed among University of Utah, EPRI, GRI and Materials and Systems Research Inc., has pooled the intellectual property of the partners to facilitate commercialization. MSRI was successful in receiving an ATP-NIST award for \$3 million, and the Center has received a subcontract from MSRI.

The Center has successfully leveraged \$495,000 in State funding to procure \$6.3 Million in Federal funding. Three patents have been issued on Center technology and one patent application is pending.

CONTACT

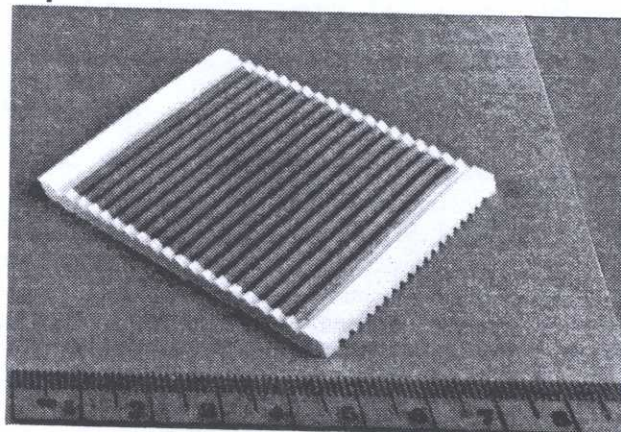
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Can You Imagine...

... a portable generator you can take on your next camping trip that efficiently converts propane directly to electricity with no flame, no moving parts, no noise, and only water vapor as an exhaust pollutant?

THE CENTER EXPLORES COMMERCIALY VIABLE METHODS OF CONVERTING GASEOUS FUELS DIRECTLY INTO ELECTRICITY USING HIGH EFFICIENT FUEL CELL TECHNOLOGIES.

Photo of a 5cm x 5cm solid oxide fuel cell (SOFC) made by the center.



The corrugations for the flow of fuel (e.g. natural gas) and oxidant (e.g. air) are in a cross-flow arrangement. The dark top surface is the cathode. SOFCs such as these are currently being configured into a stack. The objective is to construct a 2-5 kW stack for residential applications. The SOFC system will convert chemical energy of a variety of fuels into electricity.